BY ORDER OF THE COMMANDER
AIR FORCE MATERIEL COMMAND

AIR FORCE MATERIEL COMMAND
INSTRUCTION 21-115

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Maintenance

DEPOT MAINTENANCE QUALITY ASSURANCE (QA)

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction establishes the minimum requirements and standardized criteria for depot maintenance Quality Assurance (QA) Programs at the Air Logistics Centers (ALC). It also applies to Aerospace Maintenance and Regeneration Center (AMARC) industrial operations. (**Note**: Due to size and organizational structure at AMARC, QA falls under the direct control of the Commander as a Center QA and not a Directorate of Maintenance QA). This instruction implements Air Force Material Command Policy Directive (AFMCPD) 21-1, *Depot Maintenance Policy,* for establishment of Quality Assurance (QA) offices to provide quality surveillance and analysis of production and production support activities. It implements the requirement of Air Force Material Command Instruction (AFMCI) AFMCI 63-501, *AFMC Quality Assurance,* for ensuring that Center MAs maintain a documented Maintenance Quality Manual for all major organic depot maintenance workloads. It applies to all Air Force Material Command (AFMC) Depot Maintenance Activity Group (DMAG) organizations, Contract Field Teams (CFT) (when working on AFMC installations unless an equivalent quality program has been verified and approved by the contracting officer), performing depot maintenance or producing depot maintenance products, or services. Deficiency reporting will be done in accordance with TO 00-35D-54, *USAF Deficiency Reporting and Investigation System.*

Exemptions: Active duty and Reserve Combat Logistics Support Squadron (CLSS) will establish a Quality Assurance Program in accordance with AFMCI 10-202, *Combat Logistics Support*. Depot maintenance software development is excluded from the provisions of this instruction. Precision Measurement Equipment Laboratories (PMEL) will comply with TO 00-20-14, *Air Force Metrology and Calibration Program*, for development of Quality Assurance Plans but will meet the minimum requirements for the performance, documentation, correction and reporting of discrepancies identified through Core Inspection Assessments. OO-ALC Operations at OO-ALC/MAK Geographically Separated Unit (GSU) are exempt from compliance with the requirements of AFMCI 21-115. These GSUs will comply with AFSPCI 21-0114, *Intercontinental Ballistic Missile (ICBM) Maintenance Management*. Exempt GSUs are located at OO-ALC/LM Rivet Minuteman Integrated Life Extension (MILE) operations at Malmstrom AFB, MT; Minot AFB, ND; and F.E. Warren AFB, WY and also DET 41, Vandenberg AFB, CA.

SUMMARY OF REVISIONS

This instruction has been substantially revised to incorporate changes related to the reorganization of the Directorate of Maintenance (MA) within the ALCs and incorporates parts of AFMCI 21-132, which has been rescinded. This instruction should be read in its entirety.

Chapter 1

PROGRAM MANAGEMENT

1.1. General Information. This instruction provides procedures and responsibilities for depot maintenance Quality Assurance (QA) Programs. The Center MA Director has overall responsibility for product quality. Directorate employees are responsible for conformance to requirements and standards to ensure quality products and services. Center MA will implement this QA program to the extent necessary to ensure compliance with this instruction.

1.2. Local Instructions. This instruction provides only minimum requirements and will be expanded as necessary to implement and maintain the QA program. Local instruction(s) will be developed or updated and implemented within 180 days from the date of this instruction.

1.3. Quality Concepts. Quality is defined as conformance to established requirements and standards. Quality Assurance is a process that provides adequate confidence that controls are in place to create products and services that conform to established requirements/standards. QA is an integral part of all depot maintenance activities. The provisions of this instruction supplement those of other applicable directives as they apply to depot maintenance production functions and cannot be used alone. QA efforts will focus, as a minimum, on conformance of products and services to technical and safety requirements/standards, improvement of depot maintenance processes, the prevention of product and service deficiencies, and customer satisfaction. Deficiencies that occur, both internal and external, will be analyzed to identify trends, deficient processes and systemic problems. Analysis and recommendations will be presented to appropriate production management for their review and required action to prevent recurrence.

1.3.1. Process, Product, Service, and Conformance. Quality conformance is defined as a process, product, or service that meets all established requirement/standards. A conforming process is one operating within process specifications, using conforming materials, and performed by qualified/certified personnel in accordance with all technical, safety, and other applicable publications. Incoming non-conforming products/materials identified during depot maintenance processes will be reported in accordance with TO 00-35D-54, *USAF Deficiency Reporting and Investigation System*. QA personnel will assist in identifying and evaluating problems and may recommend corrective or preventive actions, as appropriate, to the level necessary for resolution. Identification of problems must be considered as an opportunity to improve both processes and products. Timely corrective and preventive action on customer complaints and feedback is critical.

1.3.2. Request for Quality Assistance (RQA) AFMC Form 77. Timely and effective responses to deficiencies and needed improvements are critical. A system of identifying deficiencies in maintenance processes and bringing solutions to bear on them is essential and must be developed at each center. Quality assistance can be requested by anyone submitting an AFMC Form 77. Forms and procedures for processing the AFMC Form 77 will be made readily available to the maintenance work force.

1.4. Depot Maintenance QA Responsibilities: Headquarters (HQ) AFMC/LG and each ALC/MA must provide the required resources to ensure effective quality assessments of the products and services. A coordinated effort of all center and command activities and a close relationship with internal and external customers is required. The chain of accountability and responsibility for quality products and services is directly to/through the Commanders, Directors, Division Chiefs, Production Supervisors, and mainte-

nance employees and will not be levied on quality organizations. In order for the overall QA system to work effectively, all AFMC personnel must take responsible actions that will contribute to safety, quality, and productivity.

1.4.1. Logistics Quality Office, HQ AFMC/LGQ. Provide command level policy, guidance, and staff coordination of all activities required to operate depot maintenance activities for Air Force weapon systems. It is the Office of Primary Responsibility (OPR) for this instruction.

1.4.1.1. Annually review each Center's Maintenance Quality Manual to ensure compliance with this instruction.

1.4.1.2. Manage the technical compliance review program.

1.4.1.3. Develops, reviews, and maintains the AFMC Maintenance Standardization and Evaluation Team (MSET) and Unit Compliance Inspection (UCI) checklists.

1.4.1.4. Review results of AFMC Maintenance Standardization Evaluation Team (MSET) inspections and technical compliance reviews for needed policy actions.

1.4.1.5. Ensure development and maintenance of Quality Assurance Specialist (QAS) training to support this instruction.

1.4.1.6. Ensure development and maintenance of the Quality Information Management Standard System (QIMSS).

1.4.1.6.1. Ensure development and maintenance of an effective and comprehensive QIMSS course that provides training necessary for all levels of users to effectively use the program.

1.4.1.7. Convene and chair the AFMC MA QA working group.

1.4.2. AFMC MA QA Working Group. Members of the working group are the ALC Maintenance Quality Assurance Branches (MAPQs) and AMARC equivalent.

1.4.2.1. Meet twice a year.

1.4.2.2. Act as advisory body to the AFMC/LGQ, Center Process Improvement and Quality Assurance Divisions (MAP), and AMARC equivalent on depot maintenance production quality matters.

1.4.2.3. Act as focal point for issues that impact depot maintenance quality assurance functions.

1.4.3. Center/CC. Provides the necessary resources, support and authority for the MA QA functions to support the requirements of this instruction as well as:

1.4.3.1. Reviews MSET findings and corrective/preventive actions.

1.4.3.2. Reviews metrics and annual technical compliance results as specified in **Chapter 3**.

1.4.4. ALC Directorate of Maintenance (MA). Provides the necessary resources and authority for the QA functions to implement and sustain the requirements of this instruction as well as:

1.4.4.1. Appoints an MA QA focal point.

1.4.4.2. Reviews MSET findings and corrective/preventive actions.

1.4.4.3. Reviews metrics and annual technical compliance results as specified in **Chapter 3**.

1.4.5. Directorate of Maintenance and AMARC QA Focal Point. Provides policy and guidance for the production QA and technical compliance review program as well as:

1.4.5.1. Provides quality information to MA Director.

1.4.5.2. Works with HQ AFMC, Center, and other Directorate quality focal points, as necessary, on all applicable quality issues.

1.4.5.3. Develops the Maintenance Quality Manual. The Maintenance Quality Manual will be supported by Production Division Quality Assurance Plans (QAP) and/or Quality Assurance Surveillance Plans (QASP).

1.4.5.4. Annually reviews the Maintenance Quality Manual to ensure currency to new or revised higher headquarter guidance.

1.4.5.5. Reviews Production Division QAPs to ensure they contain all requirements of the Maintenance Quality Manual, annually or when major changes, updates, or revisions are made.

1.4.5.6. Maintains a copy of the Maintenance Quality Manual signed by the Director.

1.4.5.7. Acts as the Directorate focal point for MSET inspections and maintains a list of OPRs for depot maintenance production MSET and UCI checklists as necessary.

1.4.5.8. Consolidates, reviews, prepares, and reports QA metrics to MA and HQ AFMC/LGQ as specified in **Chapter 3**.

1.4.5.9. Plans and executes the annual technical compliance review.

1.4.5.10. Appoints a QIMSS focal point for the Directorate.

1.4.6. Directorate of Maintenance Production Divisions. Provide necessary resources and support for QA functions to implement the requirements of the Maintenance Quality Manual in compliance with this instruction.

1.4.6.1. Review and take appropriate action on MSET/UCI findings.

1.4.6.2. Reviews metrics and internal technical compliance results as specified in **Chapter 3**, QAP data, or other production division level quality data.

1.4.6.3. Ensure development of the production division QAP and/or QASP. Will maintain a copy signed by the Production Division Chief.

1.4.6.3.1. Review QASP quarterly, update as necessary and document review.

1.4.7. Production Division QA Branches. These organizations will be made up of personnel who will conduct quality assurance assessments and other inspections as required by this instruction, other applicable publications, the Maintenance Quality Manual, the QAP, and the QASP.

1.4.7.1. Develops the QAP or ensures QAP requirements are included in the Maintenance Quality Manual.

1.4.7.2. Develops the QASP in coordination with production branches. Work quality issues with Directorate of Maintenance and other Division quality focal points as necessary.

1.4.7.2.1. Ensures all new workload requirements are considered for incorporation into the production division QAP and/or QASP if necessary.

1.4.7.3. Acts as focal point for MSET related tasks and maintain a list of Product Division level OPRs for MSET and UCI checklists as necessary.

1.4.7.4. Consolidates, reviews, prepares, and forwards applicable metrics as required.

1.4.7.5. Participates in and support the annual technical compliance review.

1.4.7.6. Performs assessments defined in **Chapter 2** and uses the QIMSS to record assessment results.

1.4.7.7. Identifies a QA representative to serve as a member of the Pre-Production Planning Team (new workload).

1.4.7.7.1. Assists in the development of WCDs by identifying quality (Q) inspection codes, if required, and any other quality requirements.

1.4.7.7.2. QA personnel are not required to be members of the Maintenance Review Team (MRT).

1.4.7.8. Ensures a QA representative is present, as required, at any problem review meetings between maintenance personnel and the responsible engineer or equipment specialist developing a solution for validated problems.

1.4.7.9. Participates in verification of any new or revised procedures and inspect any nonstandard repairs and maintenance problems when requested.

1.5. Maintenance Quality Manual. The Maintenance Quality Manual is the basic implementation guidance for depot maintenance production and production support quality requirements. It provides an organized way of communicating specific types of quality processes/procedures required, defines specific roles and responsibilities, and how those quality processes are implemented. This manual provides basic requirements for preparation of the production division's QAP. A higher-level quality manual can be used at center discretion as long as all requirements contained in this instruction are addressed.

1.5.1. Content. The Maintenance Quality Manual will be reviewed by HQ AFMC QA focal point for compliance to this instruction, at least annually or when major changes, updates, or revisions are made. This manual meets the requirements of AFMCI 63-501, *AFMC Quality Assurance* for production maintenance QAPs. The Maintenance Quality Manual will:

1.5.1.1. Identify the type (i.e., task, specific item, procedure or process) and minimum number of Personnel Evaluations (PE), Quality Verification Inspections (QVI), and Core Inspections (CI) to be conducted monthly or delegate the requirement to be included in the QAP/QASP.

1.5.1.2. Identify type and frequency of the reports required.

1.5.1.3. Identify organizations responsible for quality assurance functions.

1.5.1.4. Identify quality training requirements and organization responsible for providing that training per paragraph **1.7.** of this instruction.

1.5.1.5. The Maintenance Quality Manual will define the process for control, routing, and follow-up of the AFMC Form 77, **Request for Quality Assistance**.

1.5.1.6. Local process can be defined for use of the AFMC Form 78, **Deficiency Report**. The AFMC Form 78 can be used to report and correct internal deficiencies. The Maintenance Quality Manual will define the process for control, routing, and follow-up of this form, if used.

1.5.1.7. Local process can be defined for use of the AFMC Form 79, **Quality Feedback Review** or equivalent. The Maintenance Quality Manual will define the process for control, routing, and follow-up of this form if used.

1.5.1.8. Identify inspections to be performed based on requirements. This requirement may be delegated to the individual QAPs.

1.5.1.9. Identify corrective and preventive action process (eliminate causes of potential defects and non-conformances). Care should be taken to determine root causes of deficiencies rather than simply treating symptoms. The process will, as a minimum:

1.5.1.9.1. Include analysis of the defects and actions taken.

1.5.1.9.2. Include methods used to communicate and cross-feed information.

1.5.1.9.3. Include methods used to follow-up on corrective action, preventive action, or process changes made to prevent recurrence or new occurrences of similar non-conformances.

1.5.1.10. Define requirements for development of QAPs and QASPs.

1.5.1.11. Establish standards for Quality Assessment Results (QAR) ratings.

1.5.1.12. Define local process for documenting deficiencies, corrective/preventive action, and follow-up data into Quality Information Management Standard System (QIMSS), G015.

1.5.1.13. Define requirements to analyze quality deficiency and acceptance inspection reports and recommend appropriate corrective and preventive action to production divisions.

1.6. Quality Assurance Plan (QAP). The QAP identifies specific detailed quality processes and procedures relative to a particular organization. QAPs provide documentation of an organization's day-to-day operational QA procedures. If processes are not defined in the Maintenance Quality Manual, the QAP will document these procedures. The QAP includes what shall be accomplished, by whom, when, how, and what documents are used and how they are controlled. QAPs will be reviewed at least annually to ensure currency of existing or new policy requirements, to ensure quality program objectives are being met, and to introduce improvements to the processes. All programmed production workloads will be addressed in the QAP in support of the Maintenance Quality Manual.

1.6.1. Quality Assurance Plan (QAP) Content. As a minimum, the QAP will address the following:

1.6.1.1. Specific QA processes and procedures for individual workloads not contained in the Maintenance Quality Manual.

1.6.1.2. Data collected, type of analysis done, reports to be accomplished, and review level as a minimum if not specifically addressed in the Maintenance Quality Manual.

1.7. Quality Assurance Surveillance Plans (QASP). The QASP identifies the functions and associated actions performed by a particular organization to ensure that requirements are performed in accordance with specified standards and that an appropriate level of quality control activities are in place and operational.

1.7.1. Quality Assurance Surveillance Plan (QASP) Content. As a minimum, the QASP will address the following:

1.7.1.1. Assessment type (i.e., task specific item, procedure or process), frequency, and minimum number of Personnel Evaluations (PE), Quality Verification Inspections (QVI), Core Inspections (CI), and other assessments to be performed on a recurring basis.

1.7.1.2. Assessment Areas. For the purpose of planning and conducting assessments, major workloads will be broken down into assessment areas and documented in the Maintenance QA Manual, QAP or QASP. Assessment areas are defined as segments or portions of a workload, system, component, process, procedure, or subject matter that is investigated, inspected, evaluated or audited.

1.7.1.3. Minimum Number of Assessments. The methodology (e.g. ANSI- Z1.4 1993) or rationale used to determine type (i.e., task specific item, procedure or process) and minimum number of PEs, QVIs, and CIs to be performed will be documented in the Maintenance QA Manual, QAP or QASP.

1.7.1.4. Acceptable Quality Levels (AQL)/Standards. A standard is the acceptable quality level (number of minor defects) that can be considered satisfactory as a process average or conforming to established criteria.

1.7.1.4.1. An AQL/standard denotes the maximum allowable number of minor findings for any assessment. It must be strict enough that the task, process, or product meets an acceptable level of quality, but is not so strict that a QAR-1 rating is unattainable. The AQL/standard is derived from QA performance-based data. Production divisions will develop procedures for determining minimum AQL/standard levels delineating an "attainable" quality level. These levels will comprise the AQL standards for all assessment types.

1.7.1.4.2. Failure to meet an AQL/standard results in the assessment being rated as QAR 2 or QAR 3 depending on the severity of the deficiencies discovered during the assessment.

1.8. Quality Assurance Training. All Quality Assurance Specialists, inspectors, and evaluators (i.e., QA personnel) must be trained to the extent necessary to perform quality assurance functions.

1.8.1. Specific Training Requirements. All QA personnel must be trained or possess sufficient technical knowledge to effectively perform their duties. The Maintenance Quality Manual or QAP will identify specific technical and weapons system training requirements. QA personnel are not required to be PAC certified on tasks being assessed, but must meet any qualification (mandatory formal training) requirements defined in AFMCI 21-108, *Maintenance Training & Production Acceptance Certification (PAC) Program.*

1.8.2. Core Training Requirements. QA personnel who perform assessments will receive formal classroom training or equivalent training in the following areas:

1.8.2.1. Depot Maintenance Quality Assurance. Maintenance Standard course number MWPMAS0000200 will be used. This course includes QA orientation, the depot maintenance program, quality planning, QA standards, QA human factors, quality data, QA conformance, non-conforming material, and internal compliance reviews/MSET inspections.

1.8.2.2. Quality Statistics. QA personnel are trained in statistics to the extent necessary to perform their QA assigned duties. Training is accomplished organically or obtained through a local commercial source. Standard course chart number MRXMAS0000900 lists the topics that must be addressed. The degree of proficiency/knowledge (knowledge, skills abilities) varies based on job performance requirements contained in the applicable core documents.

1.8.2.3. Quality Auditing. QA personnel are trained in auditing to the extent necessary to perform this function. Training is accomplished organically or obtained through a local commercial source. Standard course chart number MRXMAS0000800 lists the topics that must be addressed. The degree of proficiency/knowledge (knowledge, skills abilities) varies based on job performance requirements contained in the applicable core documents.

1.8.2.4. Quality Information Management Standard System (QIMSS). All QA QIMSS users will complete standard course number MRXMAS0002400, "QIMSS Users Course." QIMSS systems administrators (including work center administrators) will complete standard course number MRXMAS0002300, "QIMSS Administrators Course."

1.8.3. Training Documentation. Employee training will be tracked in the Educational and Training Management System (ETMS) and/or in the Production Acceptance Certification Standard System (PACSS), G015. Other HQ AFMC/LG approved systems may be used to schedule and manage training requirements identified in these systems.

1.9. Data Collection. QIMSS will be used as the tool for collecting and compiling QA data collected by QA personnel. This data will be reviewed monthly to analyze results, identify trends, and will be reported to management in the appropriate forum. This information will allow management to make informed and responsible decisions about the quality system. The organization assessed is responsible for ensuring the corrective and preventive action is entered into QIMSS. Personnel using QIMSS must be trained to the extent necessary to effectively use the system.

1.10. Quality Review Board . A maintenance quality review board will be established at the executive level to include the Director/Deputy of Maintenance, QA Focal Point, Production Divisions and Production Division QA Focal Point chiefs/deputies. The quality review board will be chaired by the MA Director or Deputy.

1.10.1. The objective of the quality review board is to ensure all levels of management are informed of quality data collected by the QA functions. This forum provides analysis of data generated from assessments and compliance reviews, cross-feed of information to all production activities, evaluation of program performance, and cross-feed of process improvement efforts. This data is also used to make adjustments to the Maintenance Quality Manual, QAP, or QASPs, as deemed necessary.

1.10.2. The Maintenance Quality Manual and/or QAP will define the meeting frequency of the quality review board.

1.11. Waiver Requests and Proposed Changes. Waiver requests or proposed changes to the policy requirements of this instruction will be sent to HQ AFMC/LGQ for action. The center MA will staff waiver requests through the ALC/MAP or AMARC/QA for signature. HQ AFMC/LGQ will provide a copy of the waiver request to AFGE Council 214 for information. Requests for waivers will also contain justification as to why the unit cannot comply with existing guidance. Deviations, including "test" or "trial" programs, are NOT authorized without prior HQ AFMC/LG written approval.

1.12. Deficiency Reporting (DR) and Investigating System . The deficiency reporting and investigating system has been established to identify, report, and resolve deficiencies on military weapon systems. HQ AFMC/ENP has overall responsibility for TO-00-35D-54, *USAF Deficiency Reporting and Investigating System*, and for matters pertaining to overall DR policy and procedures.

1.12.1. Deficiencies of products meeting the reporting criteria of TO 00-35D-54, Chapter 3 shall be reported on SF 368, **Product Quality Deficiency Report** or through the Deficiency Reporting Entry and Mail System (DREAMS) electronic report or input into G021 directly.

1.13. Forms. AFMC Form 77, **Request for Quality Assistance**, AFMC Form 78, **Deficiency Report**, AFMC Form 79, **Quality Feedback Review**, and AFMC Form 343, **Quality Assurance Assessment**, SF 368, **Product Quality Deficiency Report**.

Chapter 2

QUALITY ASSESSMENTS AND RATING CRITERIA

2.1. Quality Assessments Types. The following types of evaluations, inspections and observations support the Quality Program: Personnel Evaluations (PE), Quality Verification Inspections (QVI), Core Inspections (CI), Special Inspections (SI), Management Inspections (MI), and Isolated Violations (IV). The Maintenance Quality Manual and/or QAPs will define procedures and responsibilities for performing the types of assessments listed below:

2.1.1. Personnel Evaluation (PE). A PE is an over-the-shoulder evaluation of a PAC certified mechanic/technician performing a maintenance task. PEs evaluate/assess a single technician or team of technicians' job proficiency and compliance with technical data requirements during the performance of a specific maintenance task. PEs will be rated pass or fail, and given a QAR rating. QAR ratings will be based on AQL/standards developed and identified in the Maintenance Quality Manual, QAP or QASP as applicable.

2.1.1.1. The technician/team involved must be informed a PE is about to be performed. QA personnel will explain the evaluation process and rating criteria. The evaluation starts when the individual or team begins the task, or portion of the task to be evaluated, and is completed when the job or previously determined portion of the task is finished. The TO and applicable steps covered in the task evaluation will be included on the AFMC Form 343.

2.1.1.2. General maintenance practices that relate directly to the task being performed (e.g., safety, material handling, use of tools and equipment, Foreign Object Damage prevention, Electrostatic Discharge prevention, and workmanship) will be examined during the PE. Other maintenance practices may also be examined as locally determined.

2.1.1.3. When performing a PE, QA personnel will assess if the technician performed the task as prescribed by applicable technical data.

2.1.1.4. QA personnel will provide the technician or team a critique of the PE at its completion. The technician or team's supervisor or designated representative will also be briefed of assessment results.

2.1.1.5. As a minimum, each PAC certified technician will pass a personnel evaluation every 24 months. (Note: Personnel evaluations for industrial services and non-critical support personnel is optional at local discretion.)

2.1.1.5.1. Individuals or team members will be decertified (on the evaluated task) by their supervisor for a failed PE rating. Decertification and recertification procedures are defined in AFMCI 21-108, *Maintenance Training and Production Acceptance Certification (PAC) Program*. The supervisor will notify QA when requalification/recertification of the individual or team has been accomplished.

2.1.2. Quality Verification Inspections (QVI). An assessment/evaluation of a maintenance procedure, process, product, or portion there of, while it is being accomplished, or after it has been completed and the task/WCD stamped. QVIs will not be conducted after equipment operation when such operation could invalidate indications of proper job accomplishment. This type inspection does not require disassembling parts, removal of stress panels, or like actions.

2.1.3. Core Inspection (CI). CIs are assessments of common depot production maintenance programs and processes that require continuous evaluation. They may be evaluated independently or may be performed in conjunction with any other type of assessment such as PE and QVI. Observed deficiencies beyond the CI checklist questions (i.e., stumble on) will be recorded in QIMSS under the inspection category of Isolated Violations. The HQ AFMC/LGQ website will contain checklists that identify the mandatory core inspection items. Mandatory questions, when applicable to the organization, must be evaluated for the assessment to qualify as a core inspection. The following are the only designated core inspection areas:

2.1.3.1. Material Control.

2.1.3.2. Foreign Object (FO)

2.1.3.3. Tool Control.

2.1.3.4. Work Control Documents.

2.1.3.5. Production Acceptance Certification (PAC)/Special Skills Qualification (SSQ)/Training.

2.1.3.6. Equipment.

2.1.3.7. Safety (Flight Line/Industrial).

2.1.3.8. Technical Data. (Engineering Drawings, AFMC Form 202, **Nonconforming Technical Assistance Request**, and Process Orders).

2.1.3.9. Technical Orders. (Formal Technical Order system as defined in TO 00-5-1, *AF Technical Order System*).

2.1.4. Special Inspections (SI). SIs are inspections not covered by CI checklists, Management Inspections, PEs, QVIs, or checklists accomplished as a part of the Annual Technical Compliance Review. SIs can include, but are not limited to, applicable HQ AFMC/LG inspection checklists. Special Inspections are conducted at the discretion of the local QA and are based upon analysis of assessment data. SIs are designed to provide a flexible tool to complement other quality assessment types. The Maintenance Quality Manual or QAP should clearly describe how SIs are conducted as part of an overall QA program.

2.1.5. Management Inspections (MI). MIs cover a broad category. Perform these inspections to follow up on trends, conduct investigations, or conduct research to get to the root cause of problems. Any level of management may request MIs. MIs may encompass PE/QVI trends and other inspection data, aborts and trends, in-flight emergency trends, high component or system failure rates, suspected training deficiencies, and tasks outlined in aircraft dash-6 technical orders. Report MI results to the requester, and allow him or her latitude in exploring options prior to implementing corrective actions. At local discretion, MIs can be non-rated and may be counted in QA trends.

2.1.6. Isolated Violation (IV). This category represents observed events or conditions with safety implications, or technical violations not related to an inspection or evaluation, which may be considered unsafe, not in accordance with established procedures, or, in the case of equipment, unfit to operate. Isolated violations will be documented as one of the following:

2.1.6.1. Detected Safety Violation (DSV). An unsafe act by an individual. The inspector will stop the unsafe act immediately. Do not document a separate DSV on an individual undergoing a personnel evaluation since the unsafe act automatically results in a “Fail” rating on the PE. Use the

word “Safety” when a safety violation is committed during a PE. A DSV will automatically result in a QAR 3 rating.

2.1.6.2. Technical Data Violation (TDV). An observation of any person performing maintenance without the proper technical data available and in use. The technician will have knowledge of all general directives associated with the job prior to performing the task. However, those directives need not be present at the job site. Do not document a separate TDV on an individual undergoing a PE, since failure to use technical data automatically results in a “Fail” rating. A TDV will automatically result in a QAR 3 rating if the WCD specifies “in accordance with” and the technical data is not open and in use.

2.1.6.3. Unsatisfactory Condition Report (UCR). A UCR is considered a condition other than a DSV or TDV, chargeable to the work center supervisor. Document discrepancies as a UCR when it is not possible to determine who created the condition.

2.1.7. Annual Technical Compliance Review. Technical compliance reviews will be conducted yearly and all applicable checklists used during the review process. The annual review, essentially a process/system audit, is intended to facilitate a center wide evaluation of program implementation and effectiveness. Evidence of compliance with regulatory references and all applicable HQ AFMC checklists gathered via sample inspections, PAC, SSQ, training reviews, metrics, and other related data collected throughout the year will form the basis of the assessment. Subject matter experts may be used while conducting the Technical Compliance Review. The reviews are planned, coordinated, and executed by the ALC/AMARC Maintenance QA Focal Point.

2.1.7.1. General Information. Maintenance Quality assurance function must inspect maintenance activities and applicable staff functions annually. This inspection may be accomplished as a phased inspection divided into increments throughout the specified inspection cycle. The annual review is designed to give managers a comprehensive, objective evaluation of mission capabilities and compliance with technical and management directives for each function.

2.1.7.2. The MA Director and AMARC equivalent ensure the depth and detail of the annual review is sufficient to evaluate the management capability of the maintenance organization. This is done by expanding the minimum requirements outlined herein or by adding special subject items. The Maintenance Quality Focal Point and AMARC equivalent recommend adjustments to the requirements based on trends and problem areas identified by QA data, MAJCOMs, AFMC IG/LG inspections, or audit reports.

2.1.7.3. Following a detailed compliance inspection by Higher Headquarters (HHQ), the Maintenance Quality Focal Point and AMARC equivalent may postpone a portion of the annual review schedule to allow activities an opportunity to clear discrepancies recorded. Request for postponement will be made to HQ AFMC/LG. If the annual review schedule is postponed, the Maintenance Quality Focal Point and AMARC equivalent must ensure all activities are rescheduled for inspection within 12 months following the HHQ compliance inspection.

2.1.7.4. Annual Technical Compliance Review Scheduling. Annual Reviews must be scheduled and included in monthly planning. Maintenance Quality Focal Point and AMARC equivalent coordinates the inspection schedule with the MA divisions to ensure minimum disruption of other schedules. To facilitate preparation of the schedule, Maintenance Quality Focal Point and AMARC equivalent must maintain a record that shows all activities to be inspected, date of last inspection, and the month the next inspection is due.

2.1.7.5. Review Preparation. The quality of the review is largely dependent upon thorough preparation for the assessment of each organization/process. Review preparation will include a review of the mission, the organizational structure, current projects and programs, and the past performance of the unit or activity to be assessed. Sources of information for this review include previous inspection and staff visit reports, manning authorization listing, equipment authorization and inventory documents, standards, deficiency analysis files, in-depth analysis of available automated reports or listing from the management information systems and current directives applicable to the function.

2.1.7.6. Review Requirements. When conducting an annual review, quality assurance personnel must address internal problems of the unit and problems caused by other activities outside the jurisdiction of the inspected unit. The review is primarily management oriented; however, portions of the review include a determination of technical compliance. Ensure deficiencies discovered during the review, which are beyond the unit's capability to correct, are recorded in the review report and are referred to the ALC/AMARC/CC for action.

2.1.7.7. Annual Review Report. The report constitutes the record of the review and recommendations to the MA in the areas of Maintenance Management, Technical Data/Process, Tools/Equipment and Qualification and Training. All annual review reports are prepared in the following two-part format: part I – Executive Summary of review findings; part II - major and minor discrepancies. Discrepancies are grouped and identified as major and minor for a particular division, branch or category with major discrepancies listed first. Supervisors are responsible for correction of all items, as well as for developing effective corrective action that eliminates/mitigates the root cause in order to prevent recurrence. Corrective action must be specific and must be aimed at correcting both the cause and the specifically reported item or condition.

2.2. Quality Assessment Type Ratings. A value reflecting the results of quality assessments.

2.2.1. Ratings. These ratings will be input into QIMSS. Only PEs will be rated pass or fail in addition to the QAR. Deficiencies will be classified as major or minor findings. A **minor finding** is defined as an unsatisfactory condition that requires repair or correction, but does not endanger personnel, affect safety of flight, jeopardize equipment reliability, or warrant discontinuing a process or equipment operation. A **major finding** is defined as a condition that would endanger personnel, jeopardize equipment reliability, or warrant discontinuing process or equipment operation.

2.2.1.1. QAR-1. This rating indicates the evaluated process/product met the established standard. This rating is considered a pass rating.

2.2.1.2. QAR-2. This rating indicates the evaluated process/product did not meet the established standard because of too many minor findings. This rating is considered a failed rating.

2.2.1.3. QAR-3. This rating indicates an evaluated process/product did not meet the established standard because one or more major findings were detected, the number of minor findings exceed QAR-2 criteria, or where systemic minor deficiencies are evident. This rating is considered a failed rating.

2.2.1.3.1. When a QAR-3 condition is observed, QA personnel will notify production supervision immediately. Under no circumstances will a safety error or equipment reliability error go uncorrected. If an assessment is being performed, QA personnel will consider the serious-

ness of the error committed when deciding whether or not the assessment should be allowed to continue.

2.2.1.3.2. When QAR-3 rating that is directly attributable to a certified technician(s) proficiency, that individual, team, or team member will be decertified. Decertification and recertification procedures are defined in AFMCI 21-108, *Maintenance Training and Production Acceptance Certification (PAC) Program*.

2.2.1.3.3. QA personnel must assign a QAR-3 rating if:

2.2.1.3.3.1. A TO "warning" is overlooked or a safety error that could result in personal injury is detected.

2.2.1.3.3.2. A TO "caution" is overlooked or an equipment reliability error that could result in equipment or system unreliability or damage is detected.

2.2.1.3.3.3. The person or team accomplishing the task being evaluated demonstrates a lack of technical proficiency.

2.2.1.3.4. QA personnel may assign a QAR-3 to a process/program where systemic deficiencies are evident.

2.2.1.3.5. Rating Personnel Evaluations. QA personnel will rate each evaluation based on AQLs/standards. A failed PE rating means the specific task was not performed within the established AQL/standards. The rating applies only to the specific task evaluated and not to other tasks that a technician or supervisor is qualified to perform.

2.2.1.3.5.1. Pass: Number of discrepancies does not exceed AQL/standards.

2.2.1.3.5.2. Fail: An evaluation that results in any of the following:

2.2.1.3.5.2.1. Number of discrepancies exceeds the established AQL/standards.

2.2.1.3.5.2.2. Technician fails to detect a major discrepancy while complying with an inspection or work card requirement.

2.2.1.3.5.2.3. Technician fails to comply with a step of prescribed technical data that could affect the performance of the equipment involved or cause injury to personnel.

2.2.1.3.5.2.4. Technician demonstrates a lack of technical proficiency or system knowledge, training is not documented.

2.2.1.3.5.2.5. Technician commits a safety violation.

2.2.1.3.5.2.6. Technician fails to document maintenance actions in appropriate equipment records.

2.3. AFMC Form 343 Control and Processing. Quality assessment data will be documented on the computer generated AFMC Form 343 and recorded in QIMSS. The QIMSS database collects, indexes, files, stores and maintains applicable AFMC Forms 343 data.

2.3.1. Processing. Timely corrective/preventive action is required to ensure problems are identified and corrected. QA must input the assessment into QIMSS within one work day (24 hrs). The suspense date for corrective/preventive action is 10 work days, beginning with date the defect is input into QIMSS and ending with acceptance of corrective/preventive action by QA. The production mainte-

nance function is responsible for ensuring corrective/preventive action is initiated as soon as possible and input into the QIMSS database.

2.3.1.1. Extension of Suspense Date. Local policies and procedures will be developed and documented in the Maintenance QA Manual for extension of suspense dates. Extensions will be recorded and tracked in QIMSS.

2.3.2. Follow-up Assessments. Depending on the severity of the discrepancies the QAS, QA supervisor, or management may direct specific follow-up actions. Results of follow-up assessments will be recorded in QIMSS. Follow-up assessment procedures will be documented in the Maintenance QA Manual or QAP.

Chapter 3

METERICS AND REPORTING

3.1. Purpose. The purpose of Quality Metrics is to measure the efficiency and effectiveness; and provide regular feedback to management on the health of the processes evaluated. Mandatory metrics, criteria, level/frequency of reporting and other pertinent information are identified below.

3.2. Quality Metrics. The formula for all metrics is, the number of QAR-1 rated assessments divided by the total number of that type assessment conducted in an organization for a given time period (e.g. total QAR-1 Core Tool assessments divided by the total number of Core Tool assessments performed in a division per month or at the center per quarter). Data for the metrics will be extracted from the QIMSS database in the following types of assessments:

3.2.1. Personnel Evaluation.

3.2.2. Quality Verification Inspection.

3.2.3. Each Core Inspection (identified in **paragraph 2.1.3.**).

3.3. Reporting.

3.3.1. Metrics (paragraph **3.2.**) will be reported to Division/Directorate monthly; and to Center CC and AFMC/LGQ quarterly.

3.3.2. The Annual Technical Compliance Review as defined in paragraph **2.1.7.**. Annual review data is due to HQ AFMC/LGQ no later than 15 February of each year for the previous calendar year and will include:

3.3.2.1. An executive summary, which includes the review and ratings of the four MSET Inspection Checklist Categories as found on the HQ AFMC/LGQ website: Maintenance Management, Technical Data/Process, Tools/Equipment and Qualification and Training.

3.3.2.2. Recommendations for policy changes or additions.

3.3.2.3. A current copy of the Maintenance Quality Manual.

3.3.2.4. Identify and provide top five areas causing QAR 2s and QAR 3s.

DEBRA K. WALKER, SES, Deputy Director
Directorate of Logistics

Attachment 1

GLOSSARY OF REFERANCES AND SUPPORTING INFORMATION

Abbreviations and Acronyms

Acceptable Quality Level (AQL)/Standards—A standard is the acceptable quality level (number of minor defects) that can be considered satisfactory as a process average or conforming to established criteria.

Assessment—The evaluation of a system, component, process, procedure or person.

Core Inspection—Assessments of common depot production maintenance programs and processes that require continuous evaluation using directed checklists and the mandatory questions as a minimum.

Corrective Action—The action to eliminate the cause of a detected defect or other undesirable condition.

Detected Safety Violation (DSV)—An unsafe act by an individual.

Education Training Management System (ETMS)—A web based training management tool used to establish training requirements, track and document training completion, and project future requirements.

Isolated Violation (IV)—This category represents observed events or conditions with safety implications, or technical violations not related to an inspection or evaluation, which may be considered unsafe, not in accordance with established procedures, or, in the case of equipment, unfit to operate.

Maintenance Quality Manual—A quality assurance manual provides an organized way of communicating how quality is managed; defines specific roles and responsibilities and defines how the organizations quality program is implemented. It provides the basic implementation guide required at each ALC to ensure all requirements of AFMCI 21-115 are standardized within each Production Division's QAP.

Major Finding—Defined as a condition that would endanger personnel, jeopardize equipment reliability, or warrant discontinuing process or equipment operation.

Management Inspections (MI)—MIs cover a broad category. These inspections are performed to follow up on trends, conduct investigations, or conduct research to get to the root cause of problems. Any level of management may request MIs. MIs may encompass PE/QVI trends and other inspection data, aborts and trends, in-flight emergency trends, high component or system failure rates, suspected training deficiencies, and tasks outlined in aircraft dash-6 technical orders.

Minor Finding—Defined as an unsatisfactory condition that requires repair or correction, but does not endanger personnel, affect safety of flight, jeopardize equipment reliability, or warrant discontinuing a process or equipment operation.

Personnel Evaluation (PE)—A PE is an over-the-shoulder evaluation of a PAC certified mechanic/ technician or team performing a maintenance task.

Preventive Action—The action to eliminate the cause of a potential defect or other undesirable condition.

Production Acceptance Certification (PAC)—Is a task-related program which ensures employees are certified to perform and accept completion of assigned work. PAC does this through systematic training, qualification and certification of individuals.

Quality Assessment Results (QAR) Rating—A numerical value reflecting the results of a quality assessment. There are three QAR values (1,2,3) each based on the number and severity of defect in a rated area.

Quality Assurance Personnel—Persons designated by the quality organization to accomplish quality assurance functions.

Quality Assurance Plan (QAP)—The QAP identifies specific detailed quality processes and procedures relative to a particular organization. QAPs provide documentation of an organization's day-to-day operational procedures.

Quality Assurance Surveillance Plans (QASP)—The QASP identifies the functions and associated actions performed by a particular organization to ensure that requirements are performed in accordance with specified standards and that an appropriate level of quality control activities are in place and operational.

Quality Information Management Standard System (QIMSS)—A data collection system used to collect and analyze QA data.

Quality Review Board.—An assembly of personnel established to review QAP findings and metrics on maintenance quality programs.

Quality Verification Inspection (QVI)—An assessment/evaluation of a maintenance procedure, process, product, or portion there of, while it is being accomplished, or after it has been completed and the task/WCD stamped.

Special Inspections (SI)—SIs are inspections not covered by CI checklists, Management Inspections, PEs, QVIs, or checklists accomplished as a part of the Annual Technical Compliance Review. SIs can include, but are not limited to, applicable HQ AFMC/LG inspection checklists. Special Inspections are conducted at the discretion of the local QA and are based upon analysis of assessment data.

Special Skills Qualification (SSQ)—Required for individuals that perform functions for which highly developed skills are required to perform certain tasks.

Technical Data.—Approved instructions relating to the management, repair, and/or use of a weapon system or component.

Technical Data Violation (TDV)—An observation of any person performing maintenance without the proper technical data available and in use.

Tool Control and Accountability—A program by which replaceable and consumable tools are controlled to detect/prevent loss within the workplace.

Unsatisfactory Condition Report (UCR)—A UCR is considered a condition other than a DSV or TDV, chargeable to the work center supervisor.

Work Control Document (WCD)—Information to control required work tasks, including identifying the task, skill, sequence, duration, project, finding, and inspection level of the work being performed.